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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/074,422	02/12/2002	Min-Goo Kim	678-806(P10161)	6996
28249	7590	08/18/2005	EXAMINER	
DILWORTH & BARRESE, LLP 333 EARLE OVINGTON BLVD. UNIONDALE, NY 11553			TORRES, JOSEPH D	
			ART UNIT	PAPER NUMBER
			2133	
DATE MAILED: 08/18/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/074,422

Applicant(s)

KIM ET AL.

Examiner

Joseph D. Torres

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 July 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9-13 and 17-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9-13 and 17-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 July 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 07/05/2005.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings were received on 07/05/2005. These drawings are accepted.

Response to Arguments

2. Applicant's arguments filed 07/05/2005 have been fully considered but they are not persuasive.

The Applicant contends, "It is respectfully submitted that a complementary code of a turbo code is known to one skilled in the art. Additionally, the paragraph above explains that the QCTC is referred to as such, since it is not a 'perfect complementary code', which it is respectfully submitted is also known to one skilled in the art, because a sub-code includes repeated symbols and has a different characteristic from another sub-code. More specifically, it is respectfully submitted that the terms used to describe the QCTC, i.e., 'complementary code' and 'perfect complementary code' are known to one skilled in the art. Therefore, it is respectfully submitted the definition of QCTC in the specification is enabling to one skilled in the art".

The Examiner would like to point out that if 'complementary code' and 'perfect complementary code' are well known in the art, then the Applicant should be able to provide a definition for 'complementary code' and 'perfect complementary code' with supporting documentation. The Examiner requests that the Applicant provide a

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definition for 'complementary code' and 'perfect complementary code' with supporting documentation in the Applicant's response to this Office Action. The Examiner reminds the Applicant of the Applicant's duty to disclose.

The Applicant contends, "Additionally, to supplement the Examiner's understanding of QCTCS and the related art, U.S. Patent No. 6,877,130 has been cited in an DS filed herewith. It is respectfully submitted that this patent supports Applicants' position that QCTC and related terms cited above are known to one skilled in the art".

With regard to U.S. Patent 6,877,130, the closest thing to a definition in U.S. Patent 6,877,130 is the statement, "In view of the sub-codes being produced from turbo codes, they will be called quasi-complementary turbo codes (QCTCs)" found in the last paragraph on page 16 of 09/981,934 which basically says a QCTC is a sub-code of a turbo code. The Examiner is requesting that the Applicant confirm whether this is the Applicant definition of a QCTC or not. The Examiner reminds the Applicant of the Applicant's duty to disclose.

The Applicant contends, "Further, the Examiner asserts that Claims 10 and 18 are rejected because the term 'partial bit reversal order (PBRO) interleaving' is not enabling. However, it is respectfully submitted that this method of interleaving is well known to one skilled in the art. Accordingly, it is respectfully submitted that the Examiner is incorrect with this rejection, and it is respectfully requested that this rejection be withdrawn".

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If 'partial bit reversal order (PBRO) interleaving' is well known in the art, then the Applicant should be able to provide a definition for 'partial bit reversal order (PBRO) interleaving' with supporting documentation. The Examiner requests that the Applicant provide a definition for 'partial bit reversal order (PBRO) interleaving' with supporting documentation in the Applicant's response to this Office Action. The Examiner reminds the Applicant of the Applicant's duty to disclose.

The Applicant contends, "With regard to the rejection of Claims 9-13 and 17-21 under 35 U.S.C. §112, second paragraph, as being incomplete, the Examiner asserts that that where Claim 9 recites 'a QCTC generator for generating a sub-code of a QCTC', there is an omitted structural cooperative relationship between 'a QCTC generator' and 'a QCTC' and between 'a sub-code of a QCTC' and 'a QCTC'. With regard to the Examiner's assertions concerning Claims 12, 20, and 13, i.e., that there is no structural cooperative relationship between the 'symbol repeater' and the 'QCTC generator' or between 'serially concatenated symbol sequences' and the recursively selected 'serially concatenated symbol sequence', it is respectfully submitted that the Examiner is incorrect, and that these claims are not incomplete to one skilled in the art, i.e., one skilled in the art would have no problem practicing the present invention as recited in these claims, without undue experimentation. Accordingly, it is respectfully submitted that the Examiner is incorrect with this rejection, and it is respectfully requested that this rejection be withdrawn".

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The Applicant merely states "one skilled in the art, i.e., one skilled in the art would have no problem practicing the present invention as recited in these claims, without undue experimentation", but provides no factual support to indicate any structural relationship amounts essentially to mere pleading, unsupported by proof or a showing of facts. The Applicant, to date has not provided a definition of QCTC, which impedes anyone's ability to ascertain how the invention as claimed in claim 9 would be practiced.

However, in the interest of compact prosecution and since U.S. Patent 6,877,130 appears to define a QCTC is a sub-code of a turbo code, as pointed out above, the Examiner assumes that a QCTC generator is simply a Rate Matcher. The Examiner is requesting that the Applicant confirm whether this is the Applicant definition of a QCTC generator or not. The Examiner reminds the Applicant of the Applicant's duty to disclose.

The Applicant contends, "With regard to the rejection of Claims 9-13 and 17-21 under 35 U.S.C. §112, second paragraph, as being indefinite, the Examiner takes issue with the phrase 'at a given starting position' in Claims 9 and 17. More specifically, the Examiner asserts that it is not clear how a predetermined number of symbols can be selected from a serially concatenated symbol sequence at a given position, because a starting symbol is only one symbol. However, it is respectfully submitted that this language is clear.

For example, if we have a symbol sequence of ten symbols, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, and we are to select a predetermined number of symbols, e.g., four, at a given starting

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position of the symbol sequence, e.g., the third position/symbol, then symbols 3, 4, 5, and 6 would be selected.”

Not only is the language unclear, but also, from the Applicant description, the term 'at a given starting position' is being used as a relative term without providing a standard for ascertaining the requisite degree.

The Applicant contends, “Further, the Examiner asserts that it is not clear what 'according to the coding rate' refers to in Claims 9 and 17. It is respectfully submitted that this means the given starting point is determined according to, or based on, the coding rate”.

The Examiner asserts that the terms “according to, or based on” are indefinite since the terms do not set forth the relationship between generating and the code rate, that is how the code rate is used.

The Applicant contends, “Additionally, the Examiner cites the selector 97 of Tong as performing both the multiplexing operations and the concatenation operations of Claims 9 and 17. However, Tong merely recites that the selector couples the channel interleaved bits accordingly. There is no disclosure in Tong that the selector generates a new parity symbol sequence by multiplexing the interleaved symbols of the corresponding parity symbol sequences, and serially concatenates the interleaved information symbol sequence and the new parity symbol sequence. Therefore, it is respectfully submitted that the Examiner is incorrect in rejecting Claims 9 and 17 as

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being anticipated by Tong, and it is respectfully requested that this rejection be withdrawn".

The Examiner disagrees and asserts that the selector 97 of Tong reduces a three channel parallel input to a serial input by selecting systematic and corresponding parity bits to produce a single serially-concatenated output on a single channel output.

The Examiner disagrees with the applicant and maintains all rejections of claims 9-13 and 17-21. All amendments and arguments by the applicant have been considered. It is the Examiner's conclusion that claims 9-13 and 17-21 are not patentably distinct or non-obvious over the prior art of record in view of the references, Tong; Wen et al. (US 6744744 B1, hereafter referred to as Tong) in view of Azaren; Daniel J. et al. (US 5357249 A, hereafter referred to as Azaren) as applied in the last office action, filed 01/31/2005. Therefore, the rejection is maintained.

Specification

3. A definition of "complementary code" critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. A definition of a "perfect complementary code" critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. A definition of "Quasi-Complementary Turbo Code (QCTC)" critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). On page 5, lines 19-23, a

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"Quasi-Complementary Turbo Code" is defined in terms of a "complementary code" and a "perfect complementary code" which are not defined in the specification.

The Applicant contends, "It is respectfully submitted that a complementary code of a turbo code is known to one skilled in the art. Additionally, the paragraph above explains that the QCTC is referred to as such, since it is not a 'perfect complementary code', which it is respectfully submitted is also known to one skilled in the art, because a sub-code includes repeated symbols and has a different characteristic from another sub-code. More specifically, it is respectfully submitted that the terms used to describe the QCTC, i.e., 'complementary code' and 'perfect complementary code' are known to one skilled in the art. Therefore, it is respectfully submitted the definition of QCTC in the specification is enabling to one skilled in the art".

The Examiner would like to point out that if 'complementary code' and 'perfect complementary code' are well known in the art, then the Applicant should be able to provide a definition for 'complementary code' and 'perfect complementary code' with supporting documentation. The Examiner requests that the Applicant provide a definition for 'complementary code' and 'perfect complementary code' with supporting documentation in the Applicant's response to this Office Action. The Examiner reminds the Applicant of the Applicant's duty to disclose.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the

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art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 9-13 and 17-21 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. A definition of "complementary code" critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. A definition of a "perfect complementary code" critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. A definition of "Quasi-Complementary Turbo Code (QCTC)" critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). On page 5, lines 19-23, a "Quasi-Complementary Turbo Code" is defined in terms of a "complementary code" and a "perfect complementary code" which are not defined in the specification.

The Applicant contends, "It is respectfully submitted that a complementary code of a turbo code is known to one skilled in the art. Additionally, the paragraph above explains that the QCTC is referred to as such, since it is not a 'perfect complementary code', which it is respectfully submitted is also known to one skilled in the art, because a sub-code includes repeated symbols and has a different characteristic from another sub-code. More specifically, it is respectfully submitted that the terms used to describe the QCTC, i.e., 'complementary code' and 'perfect complementary code' are known to one skilled in the art. Therefore, it is respectfully submitted the definition of QCTC in the specification is enabling to one skilled in the art".

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The Examiner would like to point out that if 'complementary code' and 'perfect complementary code' are well known in the art, then the Applicant should be able to provide a definition for 'complementary code' and 'perfect complementary code' with supporting documentation. The Examiner requests that the Applicant provide a definition for 'complementary code' and 'perfect complementary code' with supporting documentation in the Applicant's response to this Office Action. The Examiner reminds the Applicant of the Applicant's duty to disclose.

Claims 10 and 18 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. A definition for "PBRO (Partial Bit Reversal Order) interleaving" critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). Nowhere, in the specification, does the Applicant define "PBRO (Partial Bit Reversal Order) interleaving".

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 9-13 and 17-21 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01.

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Claim 9 recites, "a QCTC generator for generating a sub-code of a QCTC". The omitted structural cooperative relationships are: the relationship between "a QCTC generator" and "a QCTC". The omitted structural cooperative relationships are: the relationship between "a sub-code of a QCTC" and "a QCTC".

Claim 17 recites, "generating a sub-code of a QCTC". The omitted structural cooperative relationships are: the relationship between "a sub-code of a QCTC" and "a QCTC".

Claim 12 recites, "a symbol repeater for repeating the serially concatenated symbol sequence". The omitted structural cooperative relationships are: the relationship between the "symbol repeater" and the "QCTC generator".

Claims 12 and 20 recite, "repeating the serially concatenated symbol sequence". The omitted structural cooperative relationships are: the relationship between the repeated "serially concatenated symbol sequence" and the recursively selected "serially concatenated symbol sequence".

Claim 13 recites, "a symbol selector for generating the sub-code by selecting the predetermined number of symbols from the serially concatenated symbol sequence at the given starting position according to the given code rate". The omitted structural cooperative relationships are: the relationship between the "symbol selector" and the "QCTC generator".

The Applicant contends, "With regard to the rejection of Claims 9-13 and 17-21 under 35 U.S.C. §112, second paragraph, as being incomplete, the Examiner asserts that that where Claim 9 recites 'a QCTC generator for generating a sub-code of a QCTC', there

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is an omitted structural cooperative relationship between 'a QCTC generator' and 'a QCTC' and between 'a sub-code of a QCTC' and 'a QCTC'. With regard to the Examiner's assertions concerning Claims 12, 20, and 13, i.e., that there is no structural cooperative relationship between the 'symbol repeater' and the 'QCTC generator' or between 'serially concatenated symbol sequences' and the recursively selected 'serially concatenated symbol sequence', it is respectfully submitted that the Examiner is incorrect, and that these claims are not incomplete to one skilled in the art, i.e., one skilled in the art would have no problem practicing the present invention as recited in these claims, without undue experimentation. Accordingly, it is respectfully submitted that the Examiner is incorrect with this rejection, and it is respectfully requested that this rejection be withdrawn".

The Applicant merely states "one skilled in the art, i.e., one skilled in the art would have no problem practicing the present invention as recited in these claims, without undue experimentation", but provides no factual support to indicate any structural relationship amounts essentially to mere pleading, unsupported by proof or a showing of facts. The Applicant, to date has not provided a definition of QCTC, which impedes anyone's ability to ascertain how the invention as claimed in claim 9 would be practiced.

However, in the interest of compact prosecution and since U.S. Patent 6,877,130 appears to define a QCTC is a sub-code of a turbo code, as pointed out above, the Examiner assumes that a QCTC generator is simply a Rate Matcher. The Examiner is requesting that the Applicant confirm whether this is the Applicant definition of a QCTC

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generator or not. The Examiner reminds the Applicant of the Applicant's duty to disclose.

Claims 9-13 and 17-21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 9 and 17 recite, "recursively selecting a predetermined number of symbols from the serially concatenated symbol sequence **at a given starting position** according to the code rate" [Emphasis Added]. In particular it is not clear how "a given starting position" relates to the "serially concatenated symbol sequence" in such a manner that a predetermined number of symbols can be recursively selected from a "serially concatenated symbol sequence **at a given starting position**" [Emphasis Added] since a starting position is generally only one symbol; hence the serially concatenated symbol sequence comprising the "given starting position" only comprises one symbol, not a "predetermined number of symbols". In addition, it is not clear what "according to the code rate" refers to since all error correction codes have a code rate.

The Applicant contends, "With regard to the rejection of Claims 9-13 and 17-21 under 35 U.S.C. §112, second paragraph, as being indefinite, the Examiner takes issue with the phrase 'at a given starting position' in Claims 9 and 17. More specifically, the Examiner asserts that it is not clear how a predetermined number of symbols can be selected from a serially concatenated symbol sequence at a given position, because a

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starting symbol is only one symbol. However, it is respectfully submitted that this language is clear.

For example, if we have a symbol sequence of ten symbols, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, and we are to select a predetermined number of symbols, e.g., four, at a given starting position of the symbol sequence, e.g., the third position/symbol, then symbols 3, 4, 5, and 6 would be selected."

Not only is the language unclear, but also, from the Applicant description, the term 'at a given starting position' is being used as a relative term without providing a standard for ascertaining the requisite degree.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 9-12 and 17-20 rejected under 35 U.S.C. 102(e) as being anticipate by Tong; Wen et al. (US 6744744 B1, hereafter referred to as Tong).

See the Non-Final Action filed 01/31/2005 for detailed action of prior rejections.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
7. Claims 13 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tong; Wen et al. (US 6744744 B1, hereafter referred to as Tong) in view of Azaren; Daniel J. et al. (US 5357249 A, hereafter referred to as Azaren).
- See the Non-Final Action filed 01/31/2005 for detailed action of prior rejections.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph D. Torres whose telephone number is (571) 272-3829. The examiner can normally be reached on M-F 8-5.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert Decady can be reached on (571) 272-3819. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



**JOSEPH TORRES
PRIMARY EXAMINER**

Joseph D. Torres, PhD
Primary Examiner
Art Unit 2133